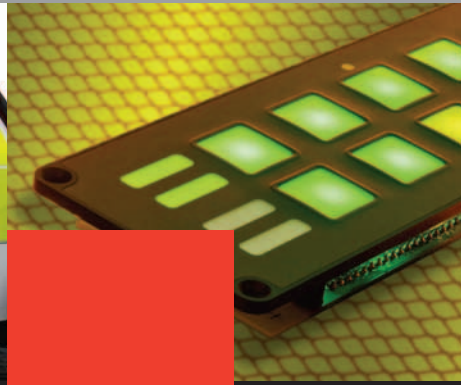


EAO – Your Expert Partner for  
**Human Machine Interfaces**



**Special Vehicles Applications**

**Components and HMI Systems**

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# Human Machine Interface Systems

## High-reliability custom-built interfaces for emergency and support vehicles

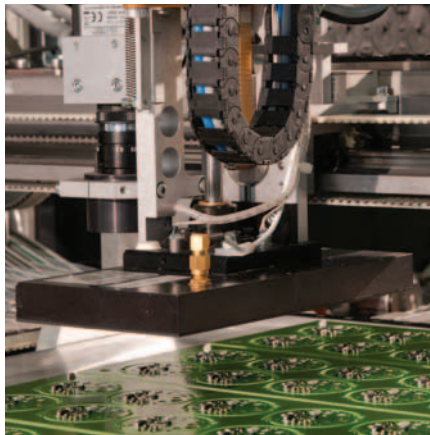
EAO developed its first illuminated pushbutton in 1958. This product became a cornerstone of the company's future and set the standard for the entire industry.

Since then EAO has flourished to become a world-leading expert partner for Human Machine Interfaces (HMI). Through experience and innovation, it now designs, manufactures and distributes one of the world's largest ranges of high-reliability HMI components.

These strengths have led EAO to the forefront of HMI system design. Many of the world's leading companies now turn to EAO to develop interfaces that are individually designed for their specific applications.

Customers receive expert advice from product specialists who understand the industry requirements from personal experience gained in the field. Within the Specialist Vehicle market, EAO builds operator interfaces for police, fire and ambulance vehicles as well as street cleaning and maintenance trucks, airport services and off-road cars.

The end-user benefits because EAO offers tailor-made HMI systems by listening to these customers and by examining technical, ergonomic and commercial specifications. The operating equipment is carefully aligned to task, to enable users and technologies to work in complete harmony. This results in higher-quality, more functional and easier to use HMI systems.



## Expert industrial design

The starting point for a successful HMI system is a thorough understanding of best design practices, ergonomics and manufacturing standards.

EAO customers use our expertise in these areas to complement their core capabilities for designing and integrating HMI control systems.

More than a contract manufacturer, EAO becomes an extension of their design team, allowing them to gain design capacity and quicker turnaround times.

## Global component manufacturing

As a worldwide manufacturer of high-quality HMI components, EAO's expertise in prototyping, tooling, plastics moulding, plating, electrical design, automation and precision-parts assembly is unsurpassed.

With their consistent tactile feel, EAO components are suitable for multiple uses in large subsystems or control panels where repeatability is critical.

With EAO on the team, customers get a strong, proven, global source of switch control products that meet industry standards and which are manufactured with stringent quality assurance procedures.

## Reliable solutions

EAO build's high-quality interior and exterior control panels for a range of specialist vehicle applications including:

- Driver's controls
- Light bars, sirens and spotlights
- Intercoms and communication
- Powered lifting devices - ladders, platforms, winches
- Security and vehicle access
- Hidden functions such as police vehicle 'Run/Lock' switches



Ladder controls for a fire engine

# Applications



A membrane front panel with Series 70 switches

Expertly designed, custom-built interfaces that meet exact requirements



## Interior membrane panels

Specialist vehicles may require updating and adaptation so EAO designs with optimum flexibility in mind. The front design and switch configuration of our membrane panels can be changed without impact to the PCB layout. This increases the functional service life and the number of uses from each panel, allowing vehicle builders to personalise panels according to the end-customer.

- Serial bus connectivity
- Choice of front plate materials and sized for exact fit
- Energy efficient LED illumination
- Dimmable to cope with changing light conditions

## Interior switching panel

Some on-board devices require more distinctive individual controls with larger surface areas. These might be better operated by discreet switches combined with other components such as joysticks and displays. They are particularly useful for control on-board lifting and moving equipment.

- Consistent front panel look and feel using pushbuttons, indicators, lever switches, buzzers and keylocks
- Possibility to laser engrave switch lens with any symbol or legend
- High-reliability switching products for handling low to high ratings



## Exterior rugged controls

External control panels for powered winches, ladders, platforms, etc. must be designed for their specific operating environment. Emergency vehicles may encounter very polluted environments – e.g. fire, smoke, and chemical spillage. Control panels must work reliably in these conditions without compromising the work of the crews.

- Wide range of HMI components protected up to IP68
- Reliable operation during extreme temperature changes up to  $-40$  to  $+70$  °C
- High visibility illumination and excellent tactile feedback even with gloved hands

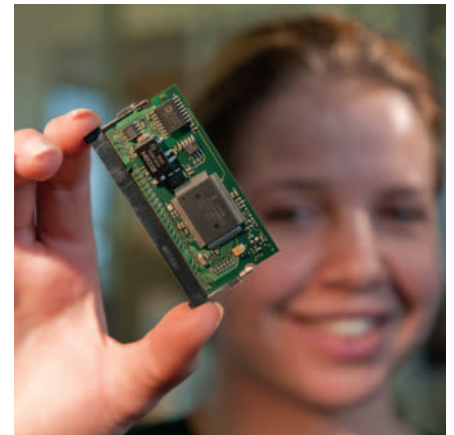


## Discrete switches and engraving

The latest laser engraving technology makes it possible to incorporate intricate designs, such as symbols and fonts, into products. This engraving provides greater definition: the characters and images are crisp and sharp, even when reproduced in the smallest sizes.

Using this technology we have created highly personalised switches such as Run/Lock buttons in police cars.

- Wear resistance – a significant benefit in applications subject to harsh conditions
- Very intricate designs can be accommodated



## Software and interface design

Modern HMI solutions, such as control panel assemblies, have embedded interfaces that link them with the larger system through serial communications connections.

EAO has extensive experience with on-board microcontrollers, real-time operating systems and encryption technology for PIN-protected secure access, as well as a variety of conventional and newer Serial Bus communication protocols:

- CAN-Bus, CANopen, CAN-J1939, ProfiBus, InterBus, DeviceNet
- USB, Ethernet, RS-232, RS-485
- GUI touch screen integration



The lifting system of this airport catering truck is controlled by a panel designed by EAO (top left)

# System engineering



From design to delivery, a highly skilled and professional service



## Concept to design

With EAO as your knowledgeable partner, you will gain design capacity and global expertise in the following areas:

- HMI system design and layout that is functional and intuitive
- Knowledge of all safety, ergonomic, industry, and international standards
- Modern design-to-manufacturing methods such as 3D CAD/CAM/CAE (Solid Edge, AutoCAD, Pro/ENGINEER and SolidWorks)
- Rapid prototyping techniques for plastic components and short-run PCBs'
- On-board microcontrollers, real-time operating systems, encryption technology and Serial Bus communication protocols
- Planned production processes to ensure just-in-time delivery

## Quality assurance and testing

EAO has a dynamic Total Quality Management system linked to all aspects of our business and is certified and managed to ISO 9001:2000, ISO 14001:2004 and other standards as required.

EAO's products and systems undergo rigorous testing to assure reliability, repeatability, and a predictable long service life. Testing capabilities include:

- Environmental test chambers
- Ingress protection (IP) testing
- In-circuit test (ICT), optical and X-ray analyses
- Finite element analysis

Adherence to international standards and extensive product testing makes EAO a trusted, knowledgeable and valued partner in the planning, design, and manufacturing of an HMI system.

04



14



51



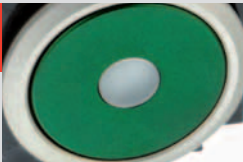
61



70



71



84



R



# Products

Series	04	14	51	61	70	71	84	R
<b>Range</b>								
Pushbutton	■	■	■	■	■	■	■	■
Indicator	■	■	■	■	■	■	■	■
Selector Switch	■	■	■	■		■		
Key Switch	■	■	■	■		■		
E-Stop	■			■			■	
Buzzer		■						
Lever switch	■	■						
<b>Mounting</b>								
Flush	■	■	■	■	■	■	■	■
Raised	■	■	■	■				
<b>Mounting hole</b>								
∅ 16 mm			■	■				■
∅ 19.2 mm								■
∅ 22.5 mm	■	■	■	■		■	■	
∅ 30.5 mm	■	■						
Square, rectangular	■		■	■	■	■		
<b>Switch rating max.</b>								
42 VAC/100mA					■		■	
250 VAC/3 A						■		
250 VAC/5 A		■	■	■				■
500 VAC/10A	■							
<b>Terminals</b>								
Solder		■	■					■
Solder/Plug-in		■	■	■			■	
Plug-in	■							
Screw	■			■				■
Ribbon cable							■	
PCB		■	■		■	■	■	
PCB-Terminal available		■	■	■				
Push-in terminal	■							
<b>Front Protection degree</b>								
IP 40		■						
IP 65	■		■	■	■	■	■	■
IP 67	■	■			■		■	
IP 68 (with protective cap)	■	■	■	■		■	■	
<b>Suitable Applications</b>								
Indoor	■	■	■	■	■	■	■	■
Outdoor	■	■	■	■	■	■	■	■

For more information on these products and many more, including a fantastic range of keypads, consult the EAO catalogue or contact your local sales office (see overleaf).

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